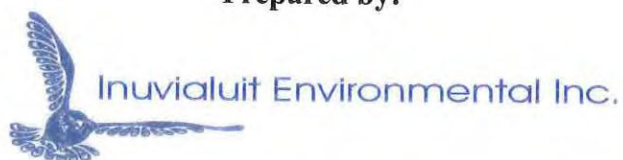


**PROJECT DESCRIPTION
FOR THE PROPOSED
AEC WEST LTD. MACKENZIE DELTA
WINTER 2000/2001 SEISMIC PROGRAM**



**Prepared for:
AEC West Ltd.
Calgary, Alberta**

Prepared by:



Calgary, Alberta and Inuvik, Northwest Territories

**August 2000
Project # 699-00**

**WATER REGISTRY COPY
DO NOT REMOVE**

**PROJECT DESCRIPTION
FOR THE PROPOSED AEC WEST LTD.
MACKENZIE DELTA WINTER 2000/2001 SEISMIC PROGRAM**

Submitted to:

AEC West Ltd.
3700, 707 8th Avenue S.W.
Calgary, Alberta
T2P 1H5

DISTRIBUTION:

6 Copies	John Duckett, Senior Engineer Western Region AEC West Ltd., Calgary, Alberta
11 Copies	Environmental Impact Screening Committee Inuvik, NT
10 Copies	Inuvialuit Land Administration Tuktoyaktuk, NT
20 Copies	Indian and Northern Affairs Canada Inuvik, NT
25 Copies	GNWT Water Board Yellowknife, NT
3 Copies	National Energy Board Calgary, Alberta
4 Copies	Inuvialuit Environmental Inc. Calgary, Alberta & Inuvik, NT

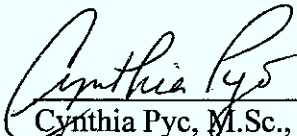
DISCLAIMER

The information and data contained within this report, including without limitation the results of any research and analysis conducted by or for Inuvialuit Environmental Inc. (IEI) pursuant to IEI's engagement, have been set forth to the best of IEI's knowledge, information and belief.


Although every effort has been made to confirm that all such information and data is factual, complete and accurate, IEI makes no guarantees or warranties whatsoever, whether expressed or implied, with respect to such information or data and accept no responsibility for any loss or damage arising there from or related thereto.

Any use that a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. IEI accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information provided in this report is derived from information gathered from the sites identified in the report. They include IEI's best judgement based upon the experience and in compliance with accepted investigative techniques. IEI shall not by the act of issuing this report be deemed to have represented thereby that any investigation and analyses conducted by them have been exhaustive, and persons relying on the results thereof do so at their own risk.


Cynthia Pyc, M.Sc., P.Biol.
Environmental Biologist

August 21, 2000
Date


Alan R. MacDonald, M.E.Des.
Vice President

August 21 / 2000
Date

EXECUTIVE SUMMARY

AEC West Ltd. (AEC), a subsidiary of Alberta Energy Company Ltd., is applying to conduct a winter 2000/2001 seismic program in the Mackenzie River Delta region of the Northwest Territories. The project entails the 2D seismic exploration of approximately 665 km of line within Exploration Licences (EL 384 and EL 385). The proposed seismic program is located on Crown lands and Inuvialuit 7(1)(b) private lands, with small portions overlapping 7(1)(a) lands within the Inuvialuit Settlement Region (ISR). The proposed seismic program falls under Federal, Inuvialuit and Territorial environmental regulatory jurisdiction. Pending regulatory approval, the project is scheduled to commence November 2000.

Inuvialuit Environmental Inc. (IEI) has been commissioned by AEC to prepare this Project Description for the winter 2000/2001 seismic program. The Project Description has been prepared to meet the requirements of Indian and Northern Affairs Canada (INAC), and the Inuvialuit Land Administration (ILA), and fulfill the operating guidelines and procedures of the Environmental Impact Screening Committee (EISC).

The proposed project is located in an upland tundra environment within the Mackenzie River Delta. The topography in the project area is flat to gently rolling, with moderate to steep slopes adjacent to waterbodies and along the East Channel of the Mackenzie River. Vegetation in the area is limited mainly to grasses, shrubs and willows up to 1.2 m tall. It is anticipated that minimal to no clearing will be required along seismic lines.

The winter seismic program has been developed with the consideration of minimizing impacts on the environment and land users. However the potential still exists for certain environmental impacts to occur over the course of the program. Potential environmental concerns for the project may include temporary alteration of wildlife habitat, elevated noise, air and traffic levels, resulting in temporary wildlife displacement and impacts to traditional land use in the vicinity of the project.

Protection measures designed to mitigate the potential environmental impacts are presented in this Project Description and in Table 9. AEC and its contractors are committed to following these measures in order to minimize the risk of potential environmental impacts and disturbance of culturally and historically significant areas.

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	i
1.0 CONTACT NAMES AND ADDRESSES	1
2.0 REGULATORY APPROVALS	3
3.0 TITLE	6
4.0 DEVELOPMENT SUMMARY	6
4.1 Project Scope	6
4.2 Seismic Program Description	9
4.2.1 Line and Access Route Selection	9
4.2.2 Access Route Construction	9
4.2.3 Pre-survey Scouting	10
4.2.4 Line Production	10
4.2.5 Line Clearing	11
4.2.6 Energy Source/Shooting	11
4.2.7 Laying-out Lines	11
4.2.8 Recording	12
4.2.9 Equipment Required	12
4.3 Base Camps	13
4.3.1 Airstrips	14
4.3.2 Fuel Storage	14
4.3.3 Wastewater Treatment and Disposal	14
4.3.4 Water Use	14
5.0 ALTERNATIVES	15
6.0 CUMULATIVE EFFECTS	15
7.0 LOCATION	18
8.0 TRADITIONAL AND OTHER LAND USES	18
9.0 DEVELOPMENT TIMETABLE	25
10.0 NEW TECHNOLOGY	25
10.1 Vehicle Guidance and Tracking System	25
10.2 Dyna - Nav System	26
11.0 ENVIRONMENTAL OVERVIEW	26
11.1 Physiography and Bedrock Geology	26
11.2 Soils	28
11.3 Climate	29
11.4 Permafrost	29
11.5 Vegetation	30
11.6 Wildlife	32
11.7 Hydrology and Fish	35
11.8 Cultural and Historic Resources	38

12.0	PROPOSED MITIGATION AND ANTICIPATED ENVIRONMENTAL IMPACTS ..	42
13.0	EMERGENCY RESPONSE PLANS	47
14.0	CLEANUP, RECLAMATION, DISPOSAL, AND/OR DECOMMISSIONING PLAN	47
15.0	OTHER ENVIRONMENTAL ASSESSMENT	47
16.0	COMMUNITY CONSULTATION.....	48
17.0	PERSONAL COMMUNICATIONS.....	53
18.0	REFERENCES	54

LIST OF APPENDICES

Appendix A	Details of Mobile Sleigh Camps	56
Appendix B	Emergency Response Plan and Fuel and Oil Spill Contingency Plan	57
Appendix C	Appropriate Licences	59

LIST OF FIGURES

Figure 1	Regional Location of proposed AEC West Ltd. Winter 2000/2001 Seismic Program	5
Figure 2	Proposed AEC West Ltd. 2D Seismic Lines and Camp Locations	8
Figure 3	Cumulative Effects of Oil and Gas Activities in the Vicinity of the Project Area	17
Figure 4	Special Management Areas Within or Near the Vicinity of the Project Area.....	24
Figure 5	Archaeological and Cultural Sites within the Vicinity of the Project.....	41

LIST OF TABLES

Table 1	Regulatory Approvals	4
Table 2	Seismic Line Set Details	7
Table 3	Special Management Areas Within or Near the Project Area	19
Table 4	Development Schedule	25
Table 5	Vegetative Species of Significance Found in the Vicinity of the Proposed Project	31
Table 6	Vertebrate Species of Concern Found in the Vicinity of the Proposed Project	34
Table 7	Fish Species Found in the Vicinity of the Proposed Project.....	36
Table 8	Previously Recorded Historical Sites in the Vicinity of the Proposed Winter Seismic Program	39

Table 9	Potential Environmental Impacts and Mitigative Measures	43
Table 10	Government and Non-Government Contacts.....	49
Table 11	Community Consultation Meetings	50
Table 12	Community Consultation Issues and Responses.....	50

LIST OF PLATES

Plate 1:	Example of pingo and fen landscape found on the northern portion of AEC's seismic program.	27
Plate 2:	View of upland tundra east of Mackenzie River where the bulk of AEC's proposed seismic program will be conducted.	27
Plate 3:	Photo of upland tundra in the area of AEC's proposed seismic program.	28
Plate 4:	Typical vegetation found in the area of the proposed seismic program.	30

1:50,000 Scale Drawings	Map Pocket
-------------------------------	------------

1.0 CONTACT NAMES AND ADDRESSES

John Duckett
Senior Engineer & Project Manager
Western Region
AEC West Ltd.
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 261-2569
Fax: (403) 716-2569
Email: johnduckett@aec.ca

(AEC's Project Contact)

Steve Harding
Team Leader, Frontiers
Western Region, New Ventures Business Unit
AEC West Ltd.
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 515-2701
Fax (403) 290-8578

(AEC's Secondary Project Contact)

Andy Popko
Aboriginal Affairs & Community Liaison
Western Region, New Ventures Business Unit
AEC West Ltd.
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 266-8259

(AEC's Contact for Community Affairs)

Dave Baer
Senior Geophysicist
Western Region, New Ventures Business Unit
AEC West Ltd.
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 261-2578
Fax: (403) 290-8578

(AEC's Geophysical Contact)

Harvey Hittel
Team Leader, Environment, Health & Safety
Western Region, New Ventures Business Unit
AEC West Ltd.
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 266-8350

(AEC's Environmental Contact)

CONTACT NAMES AND ADDRESS Cont'd

Ray Prudhomme
Consulting Seismic Advisor
3700, 707 8th Avenue SW
Calgary, AB T2P 1H5
Phone: (403) 233-3563
Cell: (403) 540-9822

(AEC's Seismic Consultant)

John Bertsch
Manager, Sales & Marketing
Veritas DGC Land
2700 - 61st Avenue SE
Calgary, AB T2C 4V2
Phone: (403) 257-6705
Fax: (403) 257-6789

(AEC's Seismic Contractor – Calgary
Contact)

Wayne Ross
Project Manager
Veritas DGC Land
2700 - 61st Avenue SE
Calgary, AB T2C 4V2
Phone: (403) 818-5015
Inuvik: (867) 777-3493

(AEC's Seismic Contractor – Inuvik
Contact)

Cynthia Pyé
Environmental Biologist
Inuvialuit Environmental Inc.
1338R 36th Avenue NE
Calgary, AB T2E 6T6
Phone: (403) 291-0777
Fax: (403) 291-1150
Email: cpyc@sorel.ca

(Environmental Consultant for Project
Description)

2.0 REGULATORY APPROVALS

AEC West Ltd. (AEC) is applying to conduct a winter 2000/2001 seismic program in the Mackenzie River Delta region of the Northwest Territories. The project is located within Exploration Licences (EL 384 and EL 385) and extends onto the Inuvik 1 and Inuvik 2 blocks, onto a small segment of the Tuk 2 block just south of Kugmallit Bay, and to Richards Island (Figure 1). The proposed seismic program is located primarily on Inuvialuit 7(1)(b) lands and Crown Lands, with small portions overlapping 7(1)(a) within the Inuvialuit Settlement Region (ISR). The project falls under Federal, Inuvialuit and Territorial environmental regulatory jurisdiction. The primary agencies with jurisdiction over the project include the Inuvialuit Land Administration (ILA), Indian and Northern Affairs Canada (INAC) and the National Energy Board (NEB). AEC is seeking a Class A Land Use and a Reconnaissance Permit from the ILA, a Land Use Permit from INAC, and a Geophysical Operation Authorization from the NEB.

Other agencies with regulatory interest in the approval process include: Fisheries and Oceans Canada (DFO) with reference to potential effects on fish and fish habitat; the Government of the Northwest Territories (GNWT) Resources Wildlife and Economic Development (RWED), regarding wildlife and associated habitat; Environment Canada and the GNWT Water Board, in regard to Water Licence requirements. The Environmental Impact Screening Committee (EISC) will be responsible for screening the project should the ILA or other Inuvialuit agency refer it to them. Should a screening occur, the EISC's responsibilities are set out in clause 11(13) of the Inuvialuit Final Agreement (IFA), which reads:

11(13). On receipt of a project description, the Screening Committee shall expeditiously determine if the proposed development could have a significant negative environmental impact and shall indicate in writing to the governmental authority competent to authorize the development that in its view:

the development will have no such significant negative impact and may proceed without environmental assessment and review under this Agreement;

the development could have significant negative impact and is subject to assessment and review under this Agreement; and

the development proposal has deficiencies of a nature that warrant a termination of its consideration and the submission of another Project Description.

If the EISC determines that the project may have a significant negative impact, the Project Description will be referred to the Environmental Impact Review Board (EIRB) or other equivalent environmental review processes for a public assessment and review pursuant to clause 11(24).

The NEB is the governmental authority competent to authorize the development within the meaning of the IFA. The NEB is also required to conduct an environmental screening of the project pursuant to the *Canadian Environmental Assessment Act* (CEAA), and to consider environmental impacts under its jurisdiction to approve the facilities and development under the *Canadian Oil and Gas Operations Act* (COGOA) and applicable regulations.

Regulatory approvals required for this project are summarized in Table 1. AEC will contact the regulatory agencies listed, as appropriate and will satisfy any requirements they may have in their respective areas of jurisdiction.

TABLE 1
REGULATORY APPROVALS

Agency	Approval Required	Status
Rudy Cockney District Manager, North Mackenzie District P.O. Box 2100 Inuvik, NT X0E 0T0	Land Use Permit	Submitted August 22, 2000
Hans Arends Land Administrator Inuvialuit Land Administration P.O. Box 290 Tuktoyaktuk, NT X0E 1C0	Class A Land Use Permit and Reconnaissance Permit	Submitted August 22, 2000
Linda Graf Secretary Environmental Impact Screening Committee P.O. Box 2120 Inuvik, NT X0E 0T0	Approval on Project Description/Environmental Protection Plan ~ if project referred by INAC	Will review if referred to screening.
Rosemarie Palmiere Data Coordinator National Energy Board Exploration and Production 444 - 7 th Avenue SW Calgary, Alberta T2P 0X8	Geophysical Operation Authorization	Submitted August 22, 2000
Sevn Bohnet Coordinator, Inuvialuit Settlement Region Government of Northwest Territories Water Board 4914 - 50th Street PO Box 1500 Yellowknife, NT X1A 2R3	Class B Water Licence	Submitted August 22, 2000



Inuvialuit Environmental Inc.

Regional Location of Proposed AEC West Ltd.
Winter 2000/2001 Seismic Program

Scale 1:1,500,00



Legend

- Proposed Seismic Location
- Winter Ice Road

699-00

August 2000

Figure 1

3.0 TITLE

AEC West Ltd. Mackenzie Delta Winter 2000/2001 Seismic Program.

4.0 DEVELOPMENT SUMMARY

4.1 Project Scope

The project proposed by AEC entails the 2D seismic exploration of approximately 665 km of line within approximately 4800 km² of land, located north of Inuvik to Kugmallit Bay, including a portion of Richards Island (Figure 1). During winter 2000/2001, AEC plans to shoot up to 20 seismic lines in this area. These lines vary in length from 14 km to 47 km and are spaced at intervals exceeding 2 km (Figure 2). It is anticipated that approximately 5 km of seismic can be conducted per day and therefore all lines may not be completed this winter. The results of the seismic program will be used to delineate areas of potential hydrocarbon accumulations that may be explored in future years through detailed seismic and exploratory drilling.

Veritas DGC Land (Veritas) has been contracted to manage the seismic operations on behalf of AEC. Veritas will provide the geophysical survey team and equipment required to conduct the seismic program. Seismic crews will be housed in mobile sleigh camps that will move to previously identified locations as the program progresses (Section 4.3). Seismic operations will commence in January and are anticipated to be complete by late April or early May 2001. Mobilization of equipment may begin as early as November, weather and ice access permitting.

AEC is proposing to use the vibroseis technique as the source of seismic input signal into the ground. To allow calculation of refraction statistics, Nodwells carrying vibrators will send source signals into the ground every 50 m along the seismic line. Receivers will be located every 25 m along the lines. Vibroseis will be conducted across all lakes with bottom-fast ice. Ice profilers will be employed for the duration of the program to determine ice thickness. When waterbodies that are not frozen to bottom are encountered along the lines, vibrators will be stacked every 50 m on either side of the waterbody to undershoot data. This seismic technique mitigates any disturbance to fish or fish habitat (Section 4.2.6). The proposed seismic line sets are outlined in Table 2 and illustrated in Figure 2.

TABLE 2
SEISMIC LINE SET DETAILS

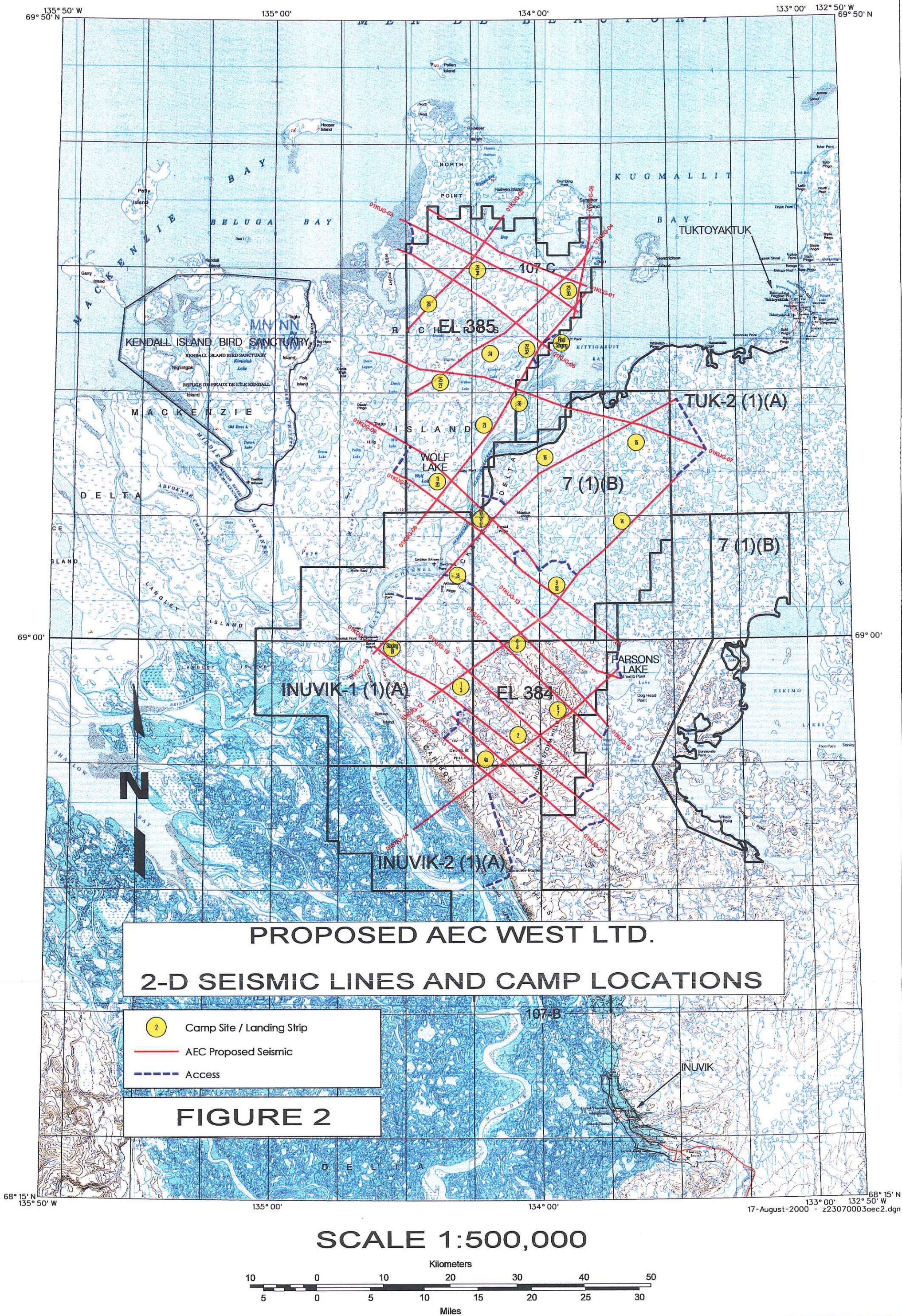
Land Ownership Designation								
	Crown ¹		7(1)(a) ²		7(1)(b) ³			
Line	Length (km)	Area (ha)	Length (km)	Area (ha)	Length (km)	Area (ha)	Total Length (km)	Total Area (ha)
01KUG01	27.50	22.00					27.50	22.00
01KUG02	26.00	20.80					26.00	20.80
01KUG03	30.00	24.00					30.00	24.00
01KUG04	38.00	30.40					38.00	30.40
01KUG05	28.00	22.40					28.00	22.40
01KUG06	14.00	11.20					14.00	11.20
01KUG07	28.38	22.70	5.70	4.56	15.92	12.74	50.00	40.00
01KUG08	40.37	32.30	2.63	2.10			43.00	34.40
01KUG09	19.11	15.29			10.89	8.71	30.00	24.00
01KUG10			22.86	18.29	36.14	28.91	59.00	47.20
01KUG11	15.12	12.10	3.13	2.50	23.75	19.00	42.00	33.60
01KUG12	6.59	5.27	9.65	7.72	33.76	27.01	50.00	40.00
01KUG13	10.65	8.52			7.85	6.28	18.50	14.80
01KUG14	23.32	18.66	16.68	13.34			40.00	32.00
01KUG15	17.95	14.36			12.05	9.64	30.00	24.00
01KUG17	23.63	18.90			2.37	1.90	26.00	20.80
01KUG19	24.49	19.59	4.01	3.21	15.92	12.74	28.50	22.80
01KUG21	26.73	21.38	17.27	13.82			44.00	35.20
01KUG23	13.45	10.76	10.55	8.44	10.89	8.71	24.00	19.20
01KUG25	0.52	0.42	15.48	12.38	36.14	28.91	16.00	12.80
TOTALS	413.81	331.05	107.96	86.36	142.73	114.19	664.50	531.60

¹ Crown Land – Federally owned lands.

² 7(1) a lands – Inuvialuit owned lands with surface and subsurface rights.

³ 7(1) b lands – Inuvialuit owned lands with surface rights only.

AEC WEST LTD.



4.2 Seismic Program Description

4.2.1 Line and Access Route Selection

Lines were located based on the interpretation of existing data and well locations from past exploration work in the delta, and to fulfill the geophysical requirements of the program. Line locations will consider setback requirements for pingos, archaeological sites, fish bearing waterbodies and other environmentally sensitive areas in keeping with all regulations. To the extent feasible, the lines will be straight, with offsets or skidding used to avoid these areas. For 2D lines, line bends up to 20 degrees and shifting the line by up to 500 metres will not significantly affect the survey. Significant changes will be decided in conjunction with the interpreting geophysicists. Setback requirements to be incorporated into the seismic program are summarized in Table 9.

The criteria used for the temporary winter access route selection included:

- utilizing the Inuvik to Tuktoyaktuk winter road as primary access;
- utilizing the Mackenzie River and its associated channels for ice access;
- utilizing seismic lines for access within the project area;
- minimizing disturbance by avoiding areas of steep slopes for access;
- minimizing disturbance by using in-and-out access on the lines so that no overland travel is required; and
- minimizing disturbance to sensitive wildlife habitat, soil, hydrological and vegetation areas.

4.2.2 Access Route Construction

Ice roads will be constructed primarily on lakes and river channels. Construction of overland access routes will consist of snow compaction along the routes chosen. Dozer blades will be equipped with mushroom shoes to elevate the blade, leaving a minimum of 10 cm snow cover on the access routes and thus preventing disturbance to the organic layer. Where wheeled equipment is used, snow will be packed and flooded to minimize ground disturbance. Overland sections will be kept to a minimum by meandering equipment during operations and utilizing the maximum amount of ice access. Both electronic and physical ice thickness profiling will be employed in conjunction with the construction and use of access routes, to evaluate ice conditions for safe travel. Access routes will be selected where slopes are minimal. Snow and/or ice ramps will be constructed on unavoidable slopes to prevent erosion and disturbance by equipment. Ice ramps will be constructed using water withdrawn from large, local lakes identified during pre-survey scouting, and the Mackenzie River (Section 4.3.4).

4.2.3 Pre-survey Scouting

Veritas will conduct pre-survey scouting prior to project commencement. This scouting will involve surveying the lines, making location determinations using a Global Positioning Satellite (GPS) system and inserting re-bar style survey monuments into the ground to mark locations. A Land Use Permit application has been submitted to ILA to conduct scouting work. Pending regulatory approval pre-survey work should be completed on or before the end of August/beginning of September 2000, in advance of the actual seismic project start date of approximately January 2001. Survey crews using helicopter support will carry out all survey work on foot. No overland vehicle travel is required for the pre-survey scouting portion of the program. Locations to be identified during pre-survey scouting include archaeological sites, pingos, and seismic lines. Survey crews will also be measuring distances across lakes and determining lake depths. This information will be used to determine water availability for withdrawal, and locations of waterbodies that are unlikely to have bottom-fast ice during the course of the program. Pre-survey scouting of lines, access routes and proposed campsites will increase operations effectiveness while mitigating disturbance to areas of ecological concern.

4.2.4 Line Production

An initial line survey will be conducted by tracking locations with a Nodwell or equivalent vehicle. Tracking vehicles will be guided using a Global Positioning System (GPS) and will proceed down the line, locating the line and source locations as determined by the geophysicists, and utilizing pre-survey information. Along the lines, receiver points and source locations will be marked with a wooden lathe to denote each point and line for the duration of the program. Receiver locations will be positioned along the line at 25 m intervals with energy source points located every 50 m. Seismic line widths will be equal to the width of a Nodwell (approximately 6 m) and shall not exceed 8 m. Wooden lathes and flagging will be retrieved as each portion of the program is completed, and used in subsequent sections of the program.

Ice profiling methods will be utilized throughout the program to evaluate the thickness of ice (related to support of the equipment) and to establish whether or not waterbodies are frozen to bottom, thus determining potential fisheries locations along the line. Where waterbodies are frozen to bottom, no year-round fisheries potential will be assumed, and the line will continue over the ice and be completed as designed utilizing vibroseis. Where ice in waterbodies is not bottom-fast and assuming potential year-round fisheries habitat is present, source points will be set back from either side of the waterbody to undershoot the area. Vibroseis will not be conducted on lakes not frozen to bottom. These procedures are designed to allow AEC to

achieve the maximum number of source points along the lines while decreasing environmental disturbance.

4.2.5 Line Clearing

Little to no line clearing will be required during this program due to a lack of tall trees and shrubs on the upland tundra, where AEC's program is situated. Bulldozer use is not anticipated, and low pressure wheeled vehicles and tracked units only, will be utilized. The units will be walked over the snow, and vegetation will be driven over, with the impacts related to crushing restricted to the aboveground woody material, leaving the root systems intact. If clearing is required, care will be taken to ensure that there is no organic mat disturbance. Frozen ground conditions, snow cover, low pressure wheeled, and tracked vehicles will minimize impacts to vegetation communities. In the event that lake access is hampered by high banks around lakes (> 1 metre), it will be necessary to construct clean snow or ice ramps for equipment access.

4.2.6 Energy Source/Shooting

The seismic program will be completed using vibroseis as the energy source set at 50 m intervals along all lines. Vibroseis utilizes low ground pressure vibrator units positioned over each of the source points along the line. The vibroseis units themselves are diesel fuelled buggy-type vibrators. The units are equipped with low-pressure tires to minimize pressure on the tundra. Each unit has a metal pad that is extended down to the ground where energy is transmitted by exerting variable pressure on the pads, held against the ground by the weight of the carrying unit. Vibrations produced by pads mounted on carrying units send sound wave signals into the ground. The vibroseis signal is input over a period of several seconds. The sound waves bounce off the various rock layers and come back to the surface where they are recorded by detectors called geophones that are connected by long cables and temporarily placed on the ground. AEC is not proposing to use dynamite as an energy source during the currently proposed program.

4.2.7 Laying-out Lines

The primary mode of cable lay-out and retrieval will be tracked units. Depending on weather and availability, the lines may be laid out with the assistance of helicopters. In this instance, helicopters will drop bags of equipment at predetermined locations and the line crews on the ground will unpack the bags of equipment, lay out the equipment and connect all appropriate cables to form a continuous seismic line. Cable and geophones will be layed-out along the side of the tracked line, and geophones placed every 25 m.

4.2.8 Recording

The recording unit will be positioned on a Nodwell or similar vehicle, and will travel down the line, hooking up to the cable at the appropriate locations. This unit records information collected by the geophones, which are connected by wire to the recording unit. The unit records information as the vibrator signal is input at each source point. Recording crews should average 5 km of progress per day depending upon weather conditions and recording parameters.

4.2.9 Equipment Required

Equipment will include:

1	Chieftain and Trailer – Recorder	59,000 lbs.
4	Mertz H-44 Track-mounted Vibrators	55,000 lbs. each
5	110C Foremost Line Trucks	42,000 lbs. each
1	110C Foremost Vib Tech Unit	42,000 lbs.
1	110C Foremost Fuel Hauler	42,000 lbs.
1	110C Foremost Recording Crew Manager Unit	42,000 lbs.
2	110 FN Crew Cab Units	50,000 lbs. each
2	110 C Additional Support Units	42,000 lbs. each
6	Skidoos	

Additional equipment that will be acquired or subcontracted through Inuvialuit companies will include at a minimum:

- 3 D7 Cats for towing the camp, building air strips and pulling fuel trains.
- 1 Michelin rubber tired front-end loader for use around camp, putting snow in melter and pulling cargo on moves.
- 2 Delta 3 units for utilization as water trucks and for fuel hauling.

Ground support equipment based out of Inuvik may include:

- 2 2000 ¾ ton Suburbans
- 1 Crew Cab – 1 ton flat deck truck
- 1 Crew Cab – 1 ton standard truck
- 1 ¾ ton Extended Cab truck

4.3 Base Camps

Seismic operations will be supported by crews housed in sleigh camps, which will move with the program. The camps will consist of three trains of sleigh-mounted trailers, hauling fuel storage, a snow melter, incinerator, generator, recreation trailer and staging sleigh. D7 Caterpillars will pull the trains along the line. On sloping terrain, sleigh camps can be separated into individual trains and pulled up slopes using a winch system. This will minimize disturbance on slopes that might result from the use of cats pulling equipment on steep terrain. Sleigh camps will remain in one location on the line for a short period of time, usually less than a few days. 31 potential locations for the sleigh camps have been identified for AEC's program, which may be re-used as lines are shot (Figure 2, 3 and 5). The re-use of camp locations where possible will minimize additional disturbance within the project area. Final camp locations will be identified during pre-survey scouting. No additional clearing is required to accommodate camps, as they will follow the access routes created for seismic lines.

The sleigh camp will consist of three strings of trailer type ski equipped structures. Diagrams of the proposed sleigh camps are found in Appendix A. The following breakdown further details the camp layout:

String A

- Trailer 1 – Water Melter and Generator
- Trailer 2 – Utility area and washrooms (male/female)
- Trailer 3 – 8 Man sleepers
- Trailer 4 – 8 Man sleepers
- Trailer 5 – 8 Man sleepers (optional)

String B

- Trailer 1 – Food Storage and Generator
- Trailer 2 – Kitchen
- Trailer 3 – Recreation Trailer/First Aid
- Trailer 4 – Office/Sleeper

String C

- Trailer 1 – Workshop and Generator
- Trailer 2 – 8 Man sleepers
- Trailer 3 – 8 Man sleepers
- Trailer 4 – 8 Man sleepers
- Trailer 5 – 8 Man sleepers

4.3.1 Airstrips

Ice access for ski-equipped airplanes will be created on an as-needed basis at prescribed camp locations for use during crew changes and/or emergency evacuations. If they are required, ice airstrips will be snow plowed and cleared of above-snow vegetation. Care will be taken during clearing to ensure that there is no organic mat disturbance. Airstrips will be cleared on water bodies or existing seismic rights-of-way wherever possible.

4.3.2 Fuel Storage

Fuel storage for the camp will consist of six individual sleighs, each holding two 2000-gallon fuel tanks, and two individual sleighs, each carrying one 500-gallon fuel tank. All tanks will be double walled, enviro-tanks, fitted with a Fuel-Com fuelling system. The Fuel-Com system is an aircraft style, spill-proof fuelling mechanism made of interlocking nozzles and receptacles. All tanks and fuelling procedures will adhere to safety standards outlined within Veritas' Fuel and Oil Spill Contingency Plan (Appendix B). Spill recovery and fire fighting equipment will be present at all times.

4.3.3 Wastewater Treatment and Disposal

Mobile sleigh camps are equipped with electric toilets that eliminate sewage waste through incineration. The resulting ash is inert and will be spread out on the ground near the camp locations. Grey water that includes only shower water, wash water and kitchen water will be temporarily collected in snow-bermed lagoons. When the camp moves on, the lagoon will be scraped up and spread out over the land as per GNWT Water Board directives.

The mobile camps are additionally equipped with an incinerator, and all solid refuse will be disposed of through burning. Any other non-combustible material will be disposed of in an approved landfill site. Additionally, Veritas will track all waste produced during operations as part of regular safety reporting procedures.

4.3.4 Water Use

Water for the mobile camps will be obtained by using a snow melter and drinking water trucked to camp from the nearest community will travel with the camp and crew. Water that is required for ice access, building snow ramps, and possibly as a supplementary camp source, will be obtained from channels of the Mackenzie River and from nearby lakes or non-frozen streams. Lakes near camp locations will be identified during the pre-survey scouting, and maximum

withdrawal rates will be determined based on a less than 1% drawdown rate. Water withdrawal rates are not expected to exceed 16 m³ per day throughout the program. The water will be extracted at a point where the seismic line intersects with the waterbody, and intake hoses will be screened with 1.3 cm (0.5") wire mesh to avoid impingement or entrainment of fish.

5.0 ALTERNATIVES

The seismic lines sets have been located to maximize the amount and quality of data collected, in reference to existing data from past seismic programs and exploratory wells in the project area. Alternative locations may not fulfill the geophysical requirements of the program. However, the lay-out of the seismic lines may be adjusted as necessary to mitigate any potential impact identified prior to or during the program operations. This report provides an environmental assessment of the project, and identifies any sensitive or significant features that should be avoided, as well as determining any site-specific mitigation measures where appropriate. Sensitive sites identified during the preparation of this report will be located during the pre-survey scouting and will be placed into a GPS database for reference throughout the program.

6.0 CUMULATIVE EFFECTS

Cumulative effects refer to the impacts on the environment that result from the combination of past, existing and imminent projects and activities. Recent activities within the vicinity of the proposed project include seismic exploration from winter 1999/2000, as well as ongoing additional land disturbances such as trails, cabins and campsites. Prior oil and gas exploration took place in the area during the 1970s and 80s.

Other oil and gas exploration activities will take place in the area surrounding the AEC seismic program during the winter 2000/2001 season. Burlington Resources Canada Energy Ltd. will be conducting a winter 2D seismic program west of the AEC project area from January to April 2001 (Figure 3). AEC and Burlington have identified common seismic line locations and have altered their lines to run contiguously, thus minimizing impacts to the environment that might result from parallel lines. Veritas DGC is the seismic contractor for both the AEC and Burlington seismic programs. The use of the same contractor ensures that the projects will be coordinated to minimize impacts caused by simultaneous operation of the projects in a common area.

Petro-Canada will be conducting a winter drilling program and seismic program in Exploration Licence #395 to the west of the AEC project area (Figure 3). There is no project overlap

between Petro-Canada's activities and the proposed AEC seismic program. In addition, construction and operation of the winter road to Tuktoyaktuk from Inuvik will be ongoing during the seismic program. There will be additional pressure on these roads primarily during mobilization and demobilization operations. Traffic at other times is expected to be insignificant and irregular.

In addition, Kuññek Resource Development Corporation has proposed a reindeer operation, currently before the EISC, that would utilize the same lands as those proposed for the AEC winter seismic operation, for grazing the herd during winter. Consultation between AEC and Kuññek has been initiated and is ongoing. Initial discussions indicate that both operations may utilize the area coincidentally without conflict.

Residual effects from this project are predicted to be low in magnitude and local in extent. If seismic results are positive, future developments within the project vicinity may include exploratory well sites and additional seismic exploration. In a manner similar to the currently proposed project, future development will be planned with consideration of environmental impacts and appropriate mitigative measures. Previous oil and gas exploration activities, in addition to the currently proposed project are shown in Figure 3. Future proposed seismic exploration in the vicinity of the project is also shown in Figure 3.

AEC WEST LTD.

